Demographic characteristics of 3,182 patients transferred by 112 emergency services in the Bolu province of Türkiye

Demographics of patients transferred with 112 service

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Abstract

Aim: In this study we aimed to analyze the demographic characteristics including gender and age groups of 3,182 emergency patients transferred by 112 EMS in the Bolu province of Türkiye.

Material and Methods: A total of 3,182 patients who used EMS were included in the study. Demographic characteristics of the patients such as age and gender, and outcomes of the cases were recorded in the forms developed by the researcher in line with the current relevant literature. The data used in our study were obtained by examining the patient transfer forms in 112 command and control centers.

Results: Of all patients, 1,287 (40.4%) were female, 1,658 (51.8%) were male and 247 (7.8%) were unspecified. In the current study, 394 patients were in the 0-18 age group, 1327 in the 19-45 age group, 626 in the 45-65 age group and 723 patients in the >66 years group. The rate of referral to hospital was lower in the 19-45 age group than in other age groups, the rate of death was significantly higher in the ≥ 66 years group.

Discussion: The use of emergency medical services varies according to gender and different age groups. Male patients used EMS more commonly compared to women. The most common EMS usage was found in the 19-45 age group. Further comprehensive multicenter studies are needed to develop strategies and policies for an efficient EMS system management.

Keywords

Emergency Medicine, Emergency Medical Service, Ambulance, Dispatch, Referral

Introduction

The number of emergencies is increasing due to the development in industry, the rapidly increasing population and traffic in the world and in our country [1, 2]. In addition, our country has extraordinary situations such as earthquakes and explosions, terrorist incidents and big fires experienced intensely. Therefore, emergency medical services (EMS) are of great importance in these situations [3, 4].

Emergency health services in our country were established in 1994 by the Ministry of Health as 112 Emergency Aid and Rescue Services, which can be reached by phone number 112, to provide rapid transport of seriously injured and critical patients to emergency services [1]. Since then, a crew consisting of a practitioner, a nurse and a driver have begun working in ambulances. The aim of EMS is to provide emergency healthcare services to patients and injured people and to deliver these persons as soon as possible to the hospital [5]. In our country, this service is provided free of charge by the Ministry of Health. Patients benefit from the EMS due to acute conditions such as hypoglycemia, septicemia, labor, asthma attack or emergency situations such as myocardial infarction, bleeding and injuries [6, 7]. The provision of EMS in developing countries and ambulance utilization rates in societies vary depending on local, socio-economic and cultural conditions [8]. Emergency patients are those who need to receive the necessary medical attention as quickly as possible. This situation requires quick and immediate decisions in medical interventions, which differentiates emergency patients from other patients. The American College of Emergency Physicians (ACEP) states that every patient who considers himself/herself as an emergency and applies to EMS, for this reason, is an emergency patient [9]. In emergency aid, it is known that the first hour following injury is very valuable for patients in emergency situations, and this period is described as the "golden hour" in which resuscitation and stabilization are performed [10]. Ambulance usage rate varies depending on age, gender, the severity of trauma or illness, geographical factors, time, socioeconomic status and insurance status [3].

In this study, we aimed to analyze the demographic characteristics, including gender and age groups of 3,182 emergency patients transferred by 112 EMS in the Bolu province of Türkiye.

Material and Methods

This study was approved by the Ethics Committee of Bolu Izzet Baysal University (Date: 2012-12-20, No: 239). Informed consent was not needed due to the retrospective nature of the study. This study followed the ethical principles of the Declaration of Helsinki revised in 2013.

A total of 3,182 patients who used EMS were included in the study. The data used in our study were obtained by examining the patient transfer forms in 112 command and control centers. Demographic characteristics of the patients such as age and gender, and the outcome of the cases were recorded in the forms developed by the researcher in line with the current relevant literature. Patients with missing data were excluded from the study.

Social security status of the cases included Social Security Institution (SSI), social security organization for artisans and the self-employed (Bag-Kur), private health insurance and abroad (others), those who do not have any health insurance (insecure), and the green card. The scene was grouped as home, vehicle, closed area and open area. The personnel group accompanying the cases was grouped as follows: those who were doctors in the accompanying group were grouped as 'team with doctors', those who were paramedics were grouped as 'paramedic teams', and those who were midwives, nurses, health officers and emergency medical technicians in the accompanying group were grouped as 'team with health personnel'. The places where the cases specified in the forms were grouped as follows: the patients who came to the university outpatient clinics as the patients who came to the 'Abant Izzet Baysal University Faculty of Medicine polyclinics', and those who presented to the Izzet Baysal Maternity and Gynecology Hospital, Mental Health and Neurological Diseases Hospital and the State Hospital polyclinics and services as patients presenting to 'state hospitals services and outpatient clinics'. The patients who came to the university emergency services were grouped as 'university emergency', and the patients who applied to the emergency services of public hospitals were grouped as 'state hospitals emergency'. Referrals made outside the province were grouped as 'patient referrals between provinces'. After the cases were seen at the scene by the health teams, the type of transport was considered as ''transfer rejection' in cases where the patients did not want to go to the hospital on their own volition, despite they needed to be transferred to the hospital.

Statistical Analysis

Statistical analysis of the article was performed using the SPSS (SPSS Statistical Package for Social Sciences, IBM Inc., Armonk, NY, USA) statistical software. The normality of the data was evaluated using the Kolmogorov-Smirnov test. Since the variables were normally distributed, comparison of the continuous variables was made using the independent t-test. Categorical variables were compared between the groups using the Chi-Square test. Continuous variables were expressed as mean ± standard deviation and categorical variables were given as frequency (n, %). $p < 0.05$ values were considered statistically significant.

Ethical Approval

Ethics Committee approval for the study was obtained.

Results

During the study period, a total of 3,182 patients who were transferred by 112 EMS in the Bolu province of Türkiye were included in the study. Of all patients, 1,287 (40.4%) were female, 1,658 (51.8%) were male and 247 (7.8%) were unspecified. In the current study, 394 patients were in the 0-18 age group, 1327 in the 19-45 age group, 626 in the 45-65 age group and 723 patients in the >66 years group. Figure 1 shows the distribution of the patients according to age groups.

There were 191 (51.9%) female and 177 (48.11%) male patients in the 0-18 age range. When the gender distributions by age groups were analyzed, the ratio of women aged 0-18 and over 66 years was found to be higher than the rate of women in other age groups (p<0.001). There were more men in the age ranges 19-45 and 46-65 compared to other age ranges (p<0.001).

Table 1. Distribution of patients' outcomes.

Case Outcomes		Age Groups				Total
		0-18	19-45	46-65	66+	
Transfer to hospital	n	314	870	468	577	2229
	%	81.1	67.7	76.2	82.0	74.5
On-site intervention	n	7	34	13	9	63
	%	1.8	2.6	2.1	1.3	2.1
Died	n	-	5	10	24	39
	%	-	0.4	1.6	3.4	1.3
Dispatch rejection	n	56	185	70	34	345
	%	14.5	14.4	11.4	4.8	11.5
Interhospital referral	n	6	19	19	27	71
	%	1.6	1.5	3.1	3.8	2.4
Other	n	1	173	34	33	244
	%	4.0	13.5	5.5	4.7	8.2
Total	n	387	1286	614	704	2991
	%	100.0	100.0	100.0	100.0	100.0

x^2=200.9, p<0.001

Table 2. Distribution of case outcomes according to gender.

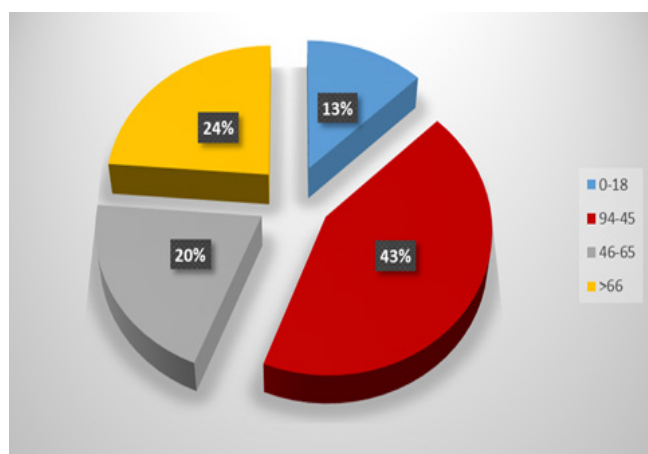| Case Outcome		Gender		Total
		Female	Male	
Dispatch to hospital	n	979	1132	2111
	%	77,8	71,3	74,2
Transfer rejection	n	177	143	320
	%	14,1	9	11,2
Interhospital referral	n	32	39	71
	%	2,5	2,5	2,5
Intervention on-site	n	27	40	67
	%	2,1	2,5	2,4
Died	n	9	15	24
	%	0,7	0,9	0,8
Other	n	34	218	252
	%	2,7	13,7	8,9
Total	n	1258	1587	2845
	%	100	100	100

x^2=117.3, p<0.0001

Figure 1. Distribution of the patients according to the age groups.
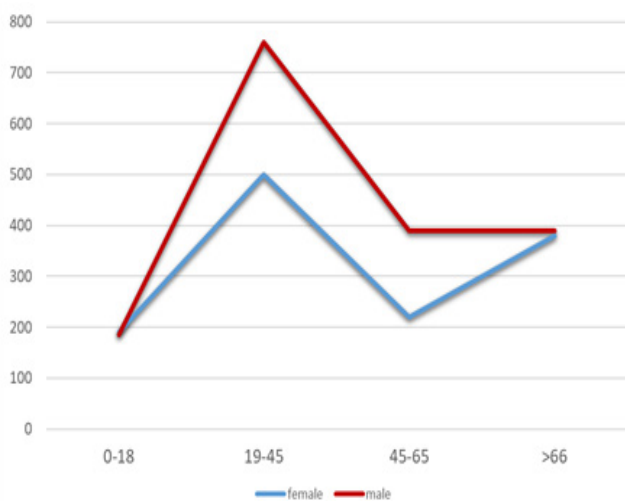
Figure 2. Distribution of the cases by age group and gender.

Three hundred and twenty-eight patients were not included in the evaluation because they did not have data. The distribution of the patients by age and gender is presented in Figure 2.

The distribution of patients' outcomes is presented in Table 1.

The distribution of the patients' outcomes according to gender is presented in Table 2.

Considering the distribution of accompanying personnel according to the types of transfer, the rate of referral from the scene to the hospital and the rate of cases that did not require referral as a result of the on-site evaluation were found to be higher in the teams with a physician, while the rate of transfer rejection was higher in teams with a paramedic. It was observed that the highest rate of transfer between hospitals and from hospital to home was in teams with other health personnel.

Discussion

In the present study, we investigate the characteristics of 3,182 patients transferred by the 112 Emergency Medical Services (EMS) in the Bolu province of Türkiye. There are some factors influencing the usage of EMS such as gender, age groups, place of dispatch, scene, social security status, etc.

In addition to fatal injuries, non-fatal injuries and emergency situations are the leading cause of hospital admission using EMS [11, 12]. In a study from Srilanka, Zimmerman et al. reported that patients use commercial, private or non-motor vehicles to get to the hospital [13]. In our country, 112 EMSs are used free of charge and provided by the Ministry of Health. In our study, the rate of EMS usage was 40.4% in female and 51.8% in male patients. Similar to our study, in a study by Rantala et al. from Sweden, the rate of using EMS was reported as 45% in females and 55% in males [14]. In a study by Karakus et al. from our country, 48.6% of the patients using EMS were females and 51.4% were males [15]. In another study by Onge et al., 46.5% of the patients were females and 53.5% were males [1]. We think that this was a result of the fact that men are more actively involved in work or other challenging conditions compared to women. However, the rate of men using

EMS has begun to decrease and the rate of women to increase due to women becoming increasingly involved in more social life and increase in the number of female drivers [1].

The EMS usage differs among age groups. In this study, 394 patients (12.83%) were in the 0-18 age group, 1327 (43.22) in the 19-45 age group, 626 (20.39%) in the 45-65 age group and 723 patients (23.55%) in the >66 years group. In a study by Say et al. the rate of EMS usage was the highest among patients ≥65 years old [10]. Whereas, in our study, EMS weas used most commonly by patients in the 19-45 age group, while the >66 age group has a rate of 23.55%. In another study by Serin et al. investigating patients brought to a newly opened EMS in Balikesir province of Türkiye, 17.5% of the patients were in the 18-39 age group, 22.57% in the 40-59 age group and 59.48% in the >60 age group [6]. In another study by Zenginol et al. performed in Gaziantep province, the rate of patients aged >65 using EMS was 17.9% [3]. In a study by Sultan et al. from Ethiopia, the rate of patients in the 56-95 age group had lower EMS usage compared to the 18-39 age group [16]. In another study by Eastwood from Australia, the likelihood of using EMS increased after 80 years of age [17]. In a study by Henricson et al. from Sweden, hospital arrival by EMS was the most common for patients between 65 and 80 years (32%), and those 81 years old and older (52%) [18], suggesting an obvious difference between developed and developing countries due to the age range of patients who use EMS transfer because of prolonged life expectancy in older patients in developed countries. On the other hand, in a study by Reynolds et al. investigating predictors of using EMS among injured patients, patients in the 56-95 age group had a lower possibility of using EMS compared to the 18-39 age group [12]. The authors stated that this result conflicts with previous studies in resource-limited settings.

In our study, the rate of dispatch from the scene to the hospital was lower in patients aged 19-45 years compared to other age groups. In addition, the rate of cases that did not require referral was lower in the 19-45 age group when compared to other age groups. In addition, the rate of transport from the hospital to the home was the highest in patients over the age of 66 similar to other studies [6, 10].

When the outcomes of the patients using EMS were evaluated, it was found that 74.2% of the patients used EMS for transfer to the hospital, 11.2% rejected dispatch, in 2.4% of the patients, on-site intervention was performed and 0.8% of the patients died at the scene. In a study by Mcmanamny et al, 84% of the patients used EMS, 13% were not transferred, and 1% died on arrival or at the scene [19]. In a study by Silanbolatlaz examining patients admitted to a third-level ED through EMS, 0.2% of patients who used EMS died in the hospital [20].

Study Limitation

The main limitation of this study is its retrospective design and being conducted in a single center. In addition, the number of patients is relatively low for such a study. Finally, we could not compare our results with previous studies exactly, because there is no study in the literature focusing on demographic characteristics of patients using emergency medical services. Within this regard, we think that our findings will be a guide for future studies.

Conclusion

The use of emergency medical services varies according to gender and different age groups. Male patients used EMS more commonly compared to women. The most common EMS usage was found in the 19-45 age group. Further comprehensive multicenter studies are needed to develop strategies and policies for the efficient EMS system management.

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